



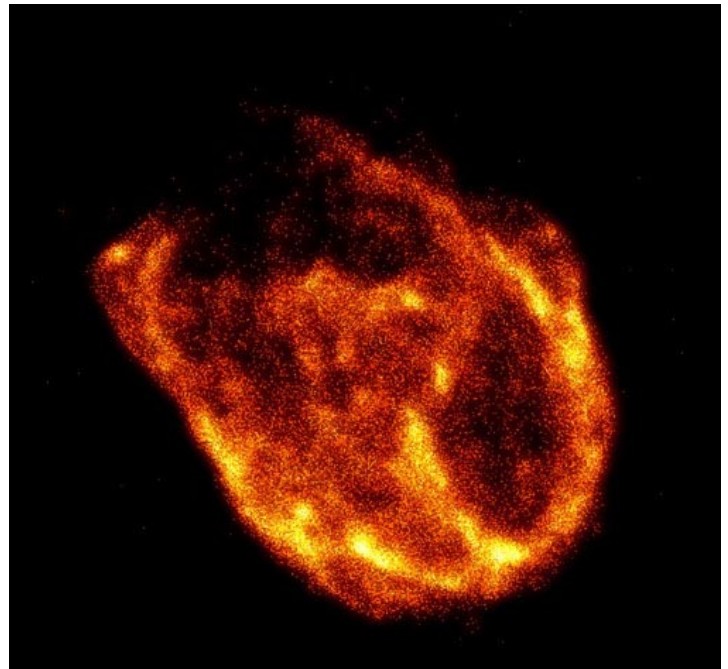
## Distant supernova remnant imaged by Chandra's high-resolution camera

The High-resolution Camera, one of the two X-ray cameras on NASA's Chandra X-ray Observatory, was placed into the focus for the first time Aug. 30. The first target was LMC X-1, a point-like source of X-rays in the Large Magellanic Cloud.

The cloud, a companion galaxy to the Milky Way, is 180,000 light years from Earth. After checking the focus with LMC X-1, Chandra observed N132D, a remnant of an exploded star in the Large Magellanic Cloud.

"These were preliminary test observations," emphasized Dr. Stephen Murray, of the Harvard-Smithsonian Center for Astrophysics, located in Cambridge, Mass. Murray is principal investigator for the High-resolution Camera. "But we are very pleased with the results. All indications are that the high-resolution camera will produce X-ray images of unprecedented clarity."

*See Chandra on page 5*



File photo

The latest Chandra image shows X-rays in the Large Magellanic Cloud, 180,000 light years from Earth.

## Space Transportation Day '99

# Conference to detail latest technology plans, programs

by Martin Burkey

NASA's future space transportation plans — from next year's experimental rocket planes to the starships of the next millennium — will be the focus of Space Transportation Day '99 Oct. 27 at Marshall.

During a one-day conference sponsored by Marshall, NASA's Lead Center for Space Transportation Systems Development, NASA officials will discuss the latest goals and programs aimed at opening space to greater commercialization and exploration. The briefing will be held at the Von Braun Center in Huntsville.

"Experimental vehicles under development and poised for flight today are the testbeds for the materials, structures, technologies, manufacturing techniques

and operational concepts of the future," said Dr. Row Rogacki, director of Marshall's Space Transportation Directorate. "These vehicles will pave the way to lowering launch costs from \$10,000 per pound to \$1,000 per pound and making operations safer and more reliable. And technologies under development are aimed at bringing down launch costs even further."

Concepts on the drawing board and in the laboratory are going to bring launch costs more in line with today's commercial airliners and make interplanetary — even interstellar — exploration feasible, Rogacki said.

The conference will give government, industry, academia and interest groups a chance to review the status of both current projects, as well as future plans, and offer feedback.

Badging will begin at 7:30 a.m. on Oct. 27. Morning sessions will cover NASA's overall future space transportation approach,

roadmaps, goals and organization, as well as a detailed briefing on the X-33 rocket plane, scheduled to begin test flights in 2000. Afternoon sessions will include X-34, X-37, future technology experiments, the Advanced Space Transportation Program, Space Shuttle upgrades, the International Space Station Propulsion Module, and Space Transportation Directorate.

The first briefing of its kind since early 1997, Space Transportation Day '99 is intended for industry and interest groups, government decision makers and staff, other government labs and agencies, and the media. Registration is required by Oct. 18. There is no registration fee.

For program information and online registration information, visit the conference's Web site at:

<http://stday.msfc.nasa.gov>

*The writer, a contractor employed by ASRI, supports the Media Relations Department.*

**"Safety Now, For the Future"**  
— Safety slogan submitted by  
Dan Mellen, ED22

# Honduran officials visit Marshall's Hydrology Center seeking NASA's help to cut future hurricane losses

## Visiting officials attend presentation of Hispanic Heritage Month proclamation

A delegation of Honduran state officials and educators visited Marshall's Global Hydrology and Climate Center last week to consult with NASA researchers to avoid a repeat of last season's Hurricane Mitch devastation.

The visitors included Silvia Xiomara Gomez Robleda, Honduran minister of natural resources and the environment; Gerardo Zepeda Bermudez, national commissioner of the Honduran Council of Science and Technology; Dr. Maria Cristina Pineda Suazo De Carias, chairwoman of the Central American Astronomical Observatory in Suyapa; and Dr. Marcos Carias Zapata, a history professor at the National Autonomous University of Honduras in Tegucigalpa.

The visitors met with NASA specialists to discuss Central American climate research and Earth science studies. The primary



Photo by Emmett Given

**Honduran officials attend workshops at the Global Hydrology and Climate Center. Earth Science Department Manager Ray Arnold, second from right, hosted the event, and NASA archaeologist Tom Sever, right, spoke on deforestation issues.**

topic of discussion was how to avoid another Hurricane Mitch, which struck Central America in October 1998, destroying 50 percent of Honduras' agriculture and costing billions in damage to the nation's infrastructure. Thousands of Hondurans died in the storm, and more than 300,000 were left homeless.

The Hydrology Center works with the international educational community to improve hurricane and severe storm prediction, provide more reliable day-to-day weather forecasting and develop strategies for more effective urban planning. The center works with the South American scientific community, studying the Southern Hemisphere's climate and water cycle in hope of minimizing future devastation from natural catastrophes.



Photo by Doug Stoffer

**Center Director Art Stephenson accepts a proclamation announcing Hispanic Heritage Month Sept. 15-Oct. 15.**



Photos by Emmett Given



Amanda Goodson



Dr. Row Rogacki



Dr. Frank Rose

### ***At Marshall's Contractor Breakfast***

At left: Center Director Art Stephenson, center, visits with contractor representatives at the Sept. 7 contractor breakfast hosted by the Marshall Center at the Tom Bevell Center in Huntsville. Above: Amanda Goodson, director of Marshall's Safety and Mission Assurance Office; Dr. Row Rogacki, director of Space Transportation Directorate; and Dr. Frank Rose, director of Science Directorate, spoke at the quarterly breakfast.



## Community Service Day set Sept. 25; Combined Federal Campaign bus tours begin Sept. 28

The fifth annual Marshall Center Community Service Day, part of the Combined Federal Campaign (CFC), will be Sept. 25. Employees are encouraged to observe the day by volunteering time and special skills to local non-profit agencies. Projects are scheduled with the following agencies: Technology Assistance for Special Consumers, Care Assurance for the Aging and Homebound, Christmas Charities, Habitat for Humanity and the Salvation Army. For information or to volunteer, call Rachel Kamenetzky at 544-1089.

The Marshall Center's 1999 CFC bus tours to recipient agencies will begin on Sept. 28.

Marshall employees, including contractors, can tour Christmas Charities, Habitat for Humanity, The Association for Retarded Citizens (Opportunity Center) of Madison County, American Red Cross, the Volunteer Center, Harris Home for Children, Children's Hospital and Chi-Ho, The Children's Home.

Two buses (A and B) will leave the Marshall Center Sept. 28-30; and Oct. 5, 6 and 7 from Bldg. 4610 at 8:15 a.m. and Bldg. 4203 at 8:30 a.m. Buses should return around 10:45 a.m.

For more information contact Dennis Gallagher at 544-7587.

Complete CFC information can be found on the Web at: <http://inside.msfc.nasa.gov/CFC99/index.html>

### The CFC bus tour schedule

**Sept. 28:** Bus A — Habitat for Humanity and Harris Home  
Bus B — Harris Home and Habitat for Humanity

**Sept. 29:** Bus A — Red Cross/Volunteer Center  
Bus B — Christmas Charities and Chi-Ho

**Sept. 30:** Bus A — Habitat for Humanity and Harris Home  
Bus B — Harris Home and Habitat for Humanity

**Oct. 5:** Bus A — Red Cross/Volunteer Center and the Opportunity Center of Madison County  
Bus B — Christmas Charities and Chi-Ho

**Oct. 6:** Bus A — Harris Home and Children's Hospital  
Bus B — Children's Hospital and Harris Home

**Oct. 7:** Bus A — Red Cross/Volunteer Center and the Opportunity Center of Madison County  
Bus B — Christmas Charities and Children's Hospital

**Combined  
Federal  
Campaign  
kicks off at  
9 a.m., Oct. 4,  
in Morris  
Auditorium**

## *Marshall retirees, onsite contractors may make one-time contribution*

Retirees and onsite contractors may contribute to the Combined Federal Campaign (CFC) this year, according to guidance from the Office of Personnel Management.

In the past, some onsite contractor personnel have expressed a desire to contribute to CFC. Individual contractor employees, as well as retirees, may now make a one-time contribution to CFC by cash, check or money order. Any onsite contractor or retiree interested in contrib-

uting should contact Lowell Newton at 544-7285.

The campaign will be conducted Oct. 4-Nov. 12. This year's theme is "Care Enough to Share Enough." Important information concerning CFC activities can be found on "Inside Marshall" by clicking on the CFC logo.

Key worker training will be held Sept. 21-23; bus tours, Sept. 28-30 and Oct. 5-7; Community Service Day, Sept. 25; campaign kickoff, Oct. 4; and speaker series, Sept. 21-Oct. 7.



# AIAA's 5<sup>th</sup> Great Paper Airplane Contest Oct. 1

The American Institute of Aeronautics and Astronautics (AIAA) will hold its annual Great Paper Airplane Contest from 4-5:30 p.m. Oct. 1 at the Marshall Activities Bldg. 4752. The contest is free and open to the public.

The institute and NASA host the annual contest to help educate children and adults in the community about the science and art of aeronautics by spurring their imagination and excitement.

Children and adults will be aircraft designers and aviators as they compete with paper airplanes for awards in the areas of accuracy, artistic appeal, distance and time of flight. There will be four age ranges: up to 2<sup>nd</sup> grade, 3<sup>rd</sup> to 5<sup>th</sup> grade, 6<sup>th</sup> to 8<sup>th</sup> grade, and high school and adults.

Only one paper airplane entry will be allowed per category, except for the artistic category, which may have multiple entries per person.



File photo

A participant in the 1998 contest launches his great paper airplane.

For the performance categories, the paper airplanes must be in the shape of an airplane — no flying disks. Only in the artistic category may the planes be any shape. Airplanes must be built with paper — no plastic, metals, composites or ceramics. It is allow-

able to use tape and glue, and paint the airplane.

Airplanes can be made at home or at the event. If the airplane is to be made at the event, paper will be provided, but paint will not be provided. Rubberbands are not allowed, and all entries must be launched by hand.

For more information, call Todd Honeycutt at 536-2428 or 461-2429.

# Redstone Arsenal hosts Oktoberfest Thursday-Sunday

The fifth annual Redstone Arsenal Oktoberfest will be held Thursday through Sunday at the Redstone parade field.

The event kicks off with opening ceremonies at 7 p.m. Thursday. An "Early Bird Special" ticket for a reduced rate of \$6 will be available Thursday and can be purchased only at the entrance to the festival. Carnival rides and arcades will be open on Thursday from 5-11 p.m., and Terry Cavanagh and the Alpine Express Band will perform from 7-10 p.m.

The carnival will be open Friday from 5 p.m.-1 a.m., Saturday noon-1 a.m., and Sunday 1-8 p.m. Tickets sold at the gate are \$8 per person. Babies in strollers will be allowed in free, but will not be permitted on any rides without paying an admission fee.

Terry Cavanagh and the Alpine Express Band will entertain each day with Alpine yodeling and foot-stomping polkas. "The Land," a local band formerly named "Heartland," will play a variety of music on Saturday from 2-6 p.m. Food and beverage tickets will be available for purchase inside the festival.

Military police ask that everyone coming to Oktoberfest enter the Arsenal through Gate 10 on Patton Road. Event parking will be marked.

For more information, call 955-7399 or visit the Web site at [www.redstone.army.mil/oktoberfest](http://www.redstone.army.mil/oktoberfest)

## Job Opportunities

**CPP 99-107-CL, AST, Technical Management, GS-801-14,** Engineering Directorate; Materials, Processes and Manufacturing Dept. Closes Sept. 20.

**CPP 99-116-JB, Security Specialist, GS-080-7,** Center Operations Directorate, Protective Services Dept. Closes Sept. 20.

**CPP 99-115-CV, AST, Mission Operations Integration, GS-801-14,** Flight Projects Directorate; Flight Systems Dept.; Hardware Development & Integration Group. Closes Sept. 28.

**CPP 99-119-JB, Emergency Preparedness Specialist, GS-301-9/11/12,** Center Operations Directorate; Facilities Engineering Dept.; Planning & Integration Group. Closes Sept. 28.

**CPP 99-120-CL, AST, Aerospace Flight Systems, GS-861-14,** Engineering Directorate; Engineering Systems Dept.; Systems Engineering Support Group. Closes Sept. 22.

**CPP 99-123-CL, Supv. AST, Aerospace Metallic Materials, GS-806-15,** Engineering Directorate; Materials, Processes and Manufacturing Dept.; Metallic Materials and Processes Group. Closes Sept. 22.

**CPP 99-121-CV, Education Programs Specialist, GS-1720-13,** Customer & Employee Relations Directorate; Education Programs Dept. Closes Sept. 22.

**CPP 122-CV, Technology Transfer Administrator, GS-301-13/14,** Customer & Employee Relations Directorate; Technology Transfer Dept. Closes Sept. 28.

**CPP 99-102-CP, Program Analyst, GS-343-7,** Science Directorate; Business Management & Administration Office. Closes Sept. 28.

**CPP 99-118-KP, AST, Flight Systems Test, GS-861-14,** Engineering Directorate; Structures, Mechanics and Thermal Dept.; Thermal & Fluid Systems Group. Closes Sept. 22.

# Marshall showcases optics technology with exhibit

by Tom Knight

Marshall's newly formed Space Optics Manufacturing Technology Center recently underscored its responsibilities and capabilities at the 44<sup>th</sup> annual meeting of the International Society for Optical Engineering held in Denver.

An exhibit, designed to showcase Marshall's unique capabilities and world-class resources to the professional optics community, illustrated how Marshall will lead NASA in developing advanced optics manufacturing technologies into the 21<sup>st</sup> century.

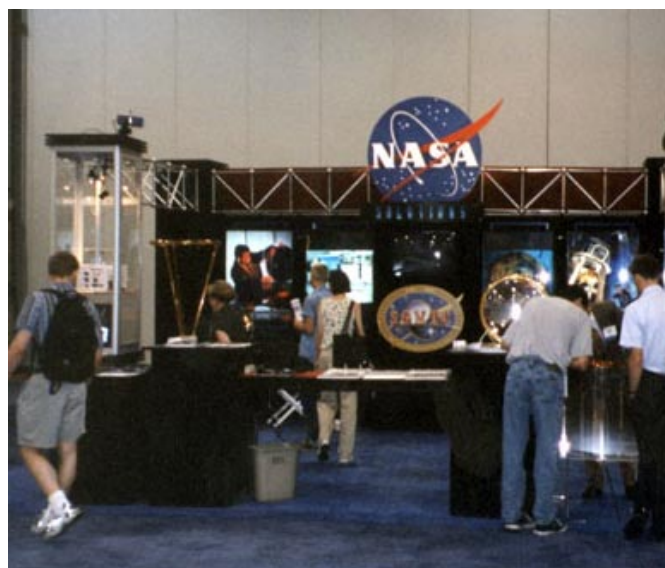
Staffing the exhibit and booth in Denver were Scott Smith, associate director of the optics center; optics center employees Andrew Keys, David Zissa and Mike Watson; David Jacobson, Next-Generation Space Telescope lead; and James Bilbro, Marshall's special assistant to the director for optics. The booth was coordinated through the Optics Manufacturing Technology Center and the Technology Transfer Department.

The optics meeting is the industry's oldest and most diverse technical symposium of its kind. More than 6,000 international researchers, applied scientists and engineers gathered to discuss the latest advancements in optical science, imaging, materials research and optical instrumentation engineering.

Marshall's demonstration pieces conveyed the evolution of lightweight optics, progressing from the relatively heavy glass primary mirror of the Hubble Space Telescope to revolutionary new ultra-lightweight mirror materials and fabrication processes to be used in creating large aperture telescopic systems, including the Next Generation Space Telescope.

Items on display included a 50-centimeter X-ray demonstration mirror formed from a diamond-turned and polished mandrel; smaller 3-centimeter and 1-centimeter X-ray mirror cones and mandrels; diffractive optic lenslet arrays; replicated nickel-alloy mirrors electroformed from a single form rather than individually polished; and adaptive optics components.

The conference also marked the debut of Marshall's optics commercialization portfolio, an information package assembled through the Technology Transfer



Courtesy photo

Visitors to the annual optics meeting learned about Marshall technologies.

Department to encourage broader utilization of Marshall-developed technologies and unique facilities.

Qualified leads from the engineers and designers who attended the event likely will lead to new licenses, partnerships, Space Act Agreements and other technology opportunities in the optics industry sector.

*The writer, a contractor employed by SCSC, supports the Technology Transfer Department.*

## Chandra

*Continued from page 1*

The N132D image shows a highly structured remnant, or shell, of 10-million-degree gas that is 80 light years across. Such a shell in the vicinity of the Sun would encompass more than 50 nearby stars. The amount of material in the N132D hot gas remnant is equal to that of 600 suns.

"The image is so rich in structure that it will take a while to sort out what is really going on," Murray said. "It could be multiple supernovas, or absorbing clouds in the vicinity of the supernova."

The unique capabilities of the high-resolution camera stem from the close match of its imaging capability to the focusing power of the mirrors. When used with the Chandra mirrors, the high-resolution camera will make images that reveal detail as small as one-half an arc second. This is equivalent to the ability to read a stop sign at a distance of 12 miles. The checkout period for the high-resolution camera will continue for the next few

weeks, during which time the Chandra science team expects to acquire images of other supernova remnants, star clusters and starburst galaxies.

Chandra has entered its eighth week of on-orbit checkout. With the successful deployment of the Low Energy Transmission Grating on Sept. 5, all Chandra instruments have now been activated. Even though Chandra's checkout has gone very smoothly, the science and engineering team is working a concern with a portion of one science instrument.

The team is investigating a reduction in the energy resolution of one of two sets of X-ray detectors in the Advanced Charge-coupled Device Imaging Spectrometer. A series of diagnostic activities to characterize the degradation, identify possible causes and test potential remedial procedures is under way.

To follow Chandra's progress, visit the Chandra News Web site at:

<http://chandra.nasa.gov>

## Employee Ads

## Miscellaneous

- ★ Love-seat-sized sofa sleeper with twin-size mattress, \$50. 971-1414
- ★ Kitchen-Aid washer/dryer, white, good condition, \$125 each; \$200 pair. 379-5284
- ★ Light oak coffee table, 4'x4' w/glass, \$65; twin mattress, \$25. 883-1869
- ★ Bedliner for Ford F150, short bed, new, \$100. 534-7791/leave message
- ★ Sofa, blue w/wood accents, \$100; walnut coffee table, \$45. 776-9165
- ★ Girl's clothes, name brands, sizes infant-girl's size 6; high chair; car seats; stroller. 859-4367
- ★ Motorola 2-way radios, 14 channels, like new w/ instructions, talk range 2 miles, \$95 obo. 461-8369
- ★ Alabama football tickets, two La. Tech, \$25 ea., two So. Miss, \$35 ea. 830-4304
- ★ Used baby crib w/mattress, very nice, \$90 obo. 837-3844
- ★ Chipper/mulcher, used one year, \$250 obo. 830-5241
- ★ Queen-size sofa sleeper, like new, brown plaid, \$125. 880-5853
- ★ 1996 Horton home, 16x80, 3-bedroom, 2-bath, lots of extras, fridge, stove/oven, dishwasher, payments \$289, buyer refinance. 772-1843
- ★ Kenmore (Whirlpool) 26.5' refrigerator, white, water/ice in door, 1 yr. old, \$800. 461-8721
- ★ Alabama/Louisiana Tech football tickets, four tickets, game day, 9/18, Birmingham, 4 p.m., \$26 each. 534-9534
- ★ Fireplace insert, screen w/glass doors, variable speed blower; AM/FM stereo 8-track cassette w/ stand speakers. 883-1686
- ★ Storm windows, some with frames, various sizes, \$2 each. 539-8976
- ★ GM 3-speed manual transmission, vintage 1980s, \$100. 534-4968
- ★ Liriope (monkey grass), \$1 each plant. 539-8976
- ★ Autographed baseball by "Catfish" Hunter, \$40. 773-7730
- ★ Burley lite bicycle trailer, seats two children, \$150. 721-9005
- ★ Electric clothes dryer, white, \$95; full-size clothes washer, \$95; both for \$185. 881-2069
- ★ Refrigerator, ice and water dispenser side-by-side, \$650; washing machine, \$150; 5 years old. 539-4117
- ★ Futon living room furniture group, sofa, armchair, coffee table, end tables, \$400. 512-9966

## Vehicles

- ★ 1998 Mustang, GT, V8, 5-speed, metallic silver, 19K miles, loaded, MACH stereo, one-owner, \$17,950. 881-3800
- ★ 1994 Nissan, Sentra-XE, 90K miles, white, auto, air bag, a/c, cassette, cruise, \$4,500 obo. 772-9930
- ★ 1993 Oldsmobile Cutlass Cierra, V-6, PS/PB, AM/FM cassette, new tires/brakes, 98K miles, \$5,000. 723-4991
- ★ 1988 Honda Accord LX, fair condition, make offer. 498-3680
- ★ 1988 Dodge Grand Caravan LE, V-6, PW/PS, air, Infinity sound, 103K miles, excellent condition, \$3,800. 883-4276
- ★ 1985 Toyota pickup, 4 cylinder, 4-speed, AM/FM cassette, new engine/paint, \$1,600. 420-4316
- ★ 1987 Dodge Shelby Daytona 2.21, 5-speed, 140K miles, new tires, 28 mpg, never wrecked, \$1,475. 753-2278
- ★ 1996 Accord LX, white, power windows, keyless entry, 60K miles, auto, new Michelin tires, \$12,500. 828-9047/day; 883-5008/evening
- ★ 1994 Chrysler LHS, 84K miles, 7yr./100K extended warranty (zero ded.), excellent condition, \$9,950. 837-5874
- ★ 1988 VW Jetta, 2-door, 5-speed, cold a/c, excellent interior, good exterior, \$1,200 obo. 722-0882
- ★ 1995 Nissan Maxima, 152K miles, 4-door, Bose stereo system, CD player/cassette, all power, \$8,500. 837-2223
- ★ 1988 Chrysler LeBaron convertible, yellow w/ tan top, 2.2 litre turbo engine, \$1,950. 778-9149/Dave
- ★ 1990 Nissan Maxima, white, 5-speed, loaded, Bose sound system, 129K miles, \$5,000. 721-8099/430-3488
- ★ 1994 Winnebago Vectra motorhome, diesel, 36', fully equipped, garaged, like new, 39K miles, \$70,000. 534-7577
- ★ 1993 Buick Century, excellent condition, \$4,300. 828-6158
- ★ 1984 Chevy Blazer, V8, 4x4, auto., PS/PB, CD player, good tires, \$4,000. 732-4862
- ★ 1991 Jeep Cherokee Limited, V6, CD changer, 112K miles. 883-7564
- ★ 1996 Saturn auto, red, 42K miles, one owner, loaded, alloy wheels, \$10,500. 837-1992

## Free

- ★ Kittens to good home. 883-9578

## Lost

- ★ 14K yellow gold small hoop earring in Bldg. 4200 area or the Medical Center area. Call 544-5552
- ★ Keys lost in parking lot of Bldg. 4201. Call 544-1969 if found.
- ★ Winnie the Pooh bracelet watch, Bldg. 4200 area or parking lot. Call 4-7180

## Found

- ★ Knife at Bldg. 4711. Call 544-4758 to identify
- ★ Thermos, found at Bldg. 4200. Call 544-4758 to identify
- ★ Sunglasses, found in parking lot, Bldg. 4200. Call 544-4758 to identify
- ★ Ring in Bldg. 4202 parking lot. Page 707-3090 to identify

## Center Announcements

- ✦ **Shuttle Buddies Breakfast** — The Shuttle Buddies will meet for breakfast at 9 a.m., Sept. 27, at Shoney's on University Drive West. For more information, call Deemer Self at 881-7757 or Gail Wynn at 852-8189.
- ✦ **MOO Breakfast** — The Management Operations Office (MOO) retirees will meet for breakfast/lunch at 10 a.m. on Sept. 23 at the Cracker Barrel in Madison. Retirees, present and former MOO employees are welcome. For more information, call 539-0042.
- ✦ **MESA Meeting** — The Marshall Engineers and Scientists Association (MESA) will meet Sept. 23 at 11:30 a.m. in Bldg. 4471, room C-105.
- ✦ **Blacks in Government** — A regular membership meeting of Blacks in Government will be held at 11 a.m. Sept. 21 at the Sparkman Complex, Bldg. 5309, room 9128. All members are invited to attend. For more information, call 859-0633.
- ✦ **MARS Ballroom Dance Club** — The MARS Ballroom Dance Club will offer tango and waltz lessons on Sept. 20, 27 and Oct. 4 in the Parish Hall of St. Stephen's Episcopal Church at 8020 Whitesburg Drive. Intermediate classes will start at 7 p.m. and beginner classes at 8. The lessons are available to the public for \$4 per person per night. For more information, call 544-0563.
- ✦ **Rocket City Rowing Club** — The Rocket City Rowing Club is offering a rowing clinic for adult beginners on Sept. 18, 25 and Oct. 2, from 10 a.m.-noon. The clinic teaches basic rowing technique, along with equipment and basic lingo. Cost is \$60. To sign up, call Halley Little at (256) 539-8841.

## MARSHALL STAR

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